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ABSTRACT

This handbook is designed to help local school districts in Oregon plan and administer kindergarten programs. Outlined are the administrative steps for starting a public kindergarten and suggestions for assessing classroom space and facility needs, developing a budget, employing kindergarten staff, planning an instructional program, purchasing instructional materials, preparing for registration, and facilitating teacher-parent communication. Also listed are some general resources for planning kindergarten curricula, and some learning activities and learning objectives in a variety of areas: language arts, reading readiness, writing readiness, social studies, environmental education, music education, science education, health education, physical education, and art education. (CS)

Kindergarten Handbook

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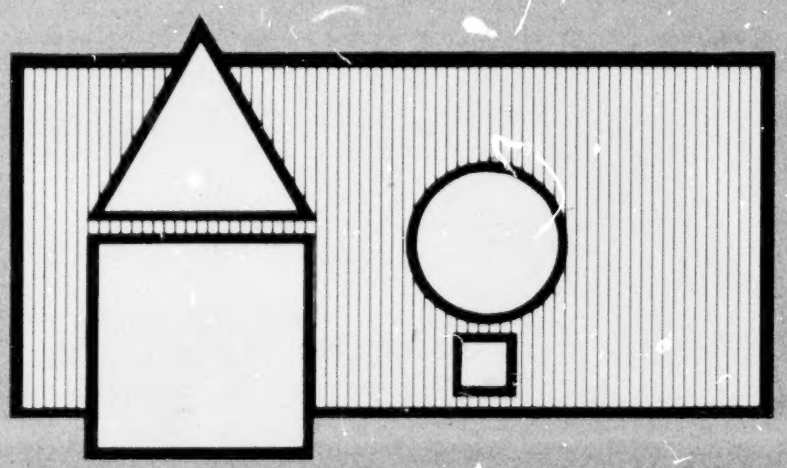

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PREFACE

In July 1973, the Oregon State Legislature passed House Bill 2031, authorizing local school boards to implement public school kindergartens under standards established by the State Department of Education. This action reflects the increasing support for the expansion of early childhood education in Oregon.

Many types of school programs for children under the age of six are currently being tried in various settings. Head Start programs, day care centers, and in private nurseries and kindergartens. Students entering the first grade after attending these programs consistently show a distinct advantage over other children in their social adjustment and their readiness to learn. The development of public kindergartens may be instrumental in reducing the number of primary school children with special learning difficulties.

This handbook has been assembled by the State Department of Education staff to assist local school districts in planning and administering kindergarten programs. It includes a section detailing the legal framework for implementation of kindergartens as well as suggestions and resources for kindergarten program planning.

The State Department of Education will continue to support the development of early childhood education by supplying districts with supportive materials relating to the administration, planning and evaluation of kindergarten programs. Consultant services in early childhood education are also available to local school districts from the Department.

Jesse Fasold
Superintendent of Public Instruction

INTRODUCTION

Research has clearly demonstrated that: (1) the development of intellectual ability is greatly affected by what happens to children before they reach first grade, and (2) by the age of six most children have already developed a considerable part of the intellectual ability they will possess as adults.

In Oregon, interest is increasing in the education of children below six. Kindergarten has been established as part of public education by law. Many parents seek private nursery schools and kindergartens for their children in areas where there are no public school programs; others work endlessly to organize cooperative nursery schools so that their children may have group experiences.

The increased public recognition of the value of such projects as Head Start is another indication of growing interest in kindergartens. Some parents not living in disadvantaged areas are suggesting that public education should not be confined to any one economic group, but rather be available to all children whose parents seek it. Educators, as well as those concerned with the social, political, and economic welfare of our nation, are recognizing the need for carefully planned educational programs for young children. The establishment of hundreds of new day care centers, nursery schools, and prekindergarten programs increases the importance of well-planned programs which will provide continuity and consistent development at every level.

Guidelines are needed for establishing, analyzing, examining, and evaluating early childhood programs; they should include well-defined objectives and procedures, responsiveness to the children who are served, and significant involvement of parents.

In planning curriculum programs for kindergartens, we recommend a preventive, diagnostic-prescriptive approach based on an assessment plan as a way to achieve the best educational opportunity for each learner. Assessment should include both health and academic surveys of a child's strengths and limitations.

While the curriculum section of this handbook is not a complete design, it is hoped that these resources will stimulate districts to develop their own creative programs, responsive to their particular needs.

The handbook is intended as a resource tool. The staff of the Oregon Department of Education will be happy to offer consultant services in early childhood education at the request of local districts. Contact Jean Spaulding, 378-3602.

00004

CONTENTS

PREFACE i

INTRODUCTION

Kindergarten as an Established Part of Public Early Childhood Education iii

SECTION I

Administrative Steps for Starting a Public Kindergarten 1

SECTION II

Resources for Planning Kindergarten Curriculum 7

00005

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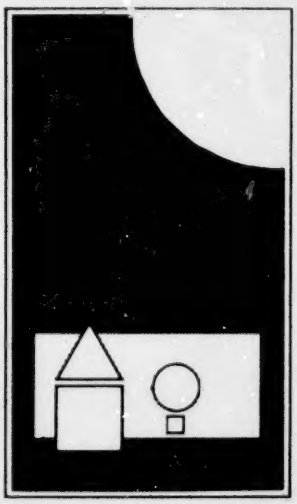
SECTION 1



Administrative Steps for Starting a Public Kindergarten

ADMINISTRATIVE STEPS FOR STARTING A PUBLIC KINDERGARTEN

Before a local school district takes steps to start a kindergarten program, the basic reason for establishing the program should be stated, because this establishes the basic philosophy for program development.

Kindergartens provide a unique opportunity to:

- Provide an instructional program meeting the wide range of social and intellectual differences in children when they come to school
- Develop each child's learning potential
- Create an atmosphere in which each child can experience success
- Provide opportunities for each child to think creatively and express ideas in creative ways
- Arouse natural curiosity and guide the thinking process
- Provide satisfying experiences in group living
- Increase the thinking process of children in a wide area of intellectual pursuits.

Programs that are designed to provide these opportunities will include:

- Educational experiences for children at all levels of physical and intellectual development
- Work and play experiences that foster the attitudes and abilities necessary for learning.

Once a local school district is committed to starting a kindergarten program, the following steps will provide for implementation of the kindergarten.

1. AUTHORIZE A KINDERGARTEN PROGRAM THROUGH THE LOCAL DISTRICT SCHOOL BOARD.

The legal authority for establishing and maintaining kindergartens is contained in House Bill 2031, authorizing local district school boards of any size to implement a public school kindergarten. No public vote is needed to include kindergartens in the regular school program, and the operating budget for the kindergarten will be included in the regular district budget. The school board authorizes kindergartens by establishing them as the entry level to school in an official board action recorded in the minutes.

2. LOCATE THE EXPECTED NUMBER OF KINDERGARTEN PUPILS AND ASSESS THEIR INDIVIDUAL NEEDS.

Eligibility: House Bill 2031 defines the kindergarten student as a child in the year before attendance in first grade. The kindergarten should be open to all children of the proper age that reside in the district. Kindergarten attendance is not mandated by the state; the Oregon Compulsory Attendance Law (ORS 339.010) requires children to be in school by the age of seven. Local school districts may make their own regulations regarding school entrance; they may stipulate that all children enter school through kindergarten for assessment and placement, or they may assign children to the kindergarten if they are five years old by November 5 (basing age on the law that specifies children should be six years old by November 5 to enter the first grade).

Assessment of special needs: Any kindergarten classroom will include children with a wide range of mental and physical abilities, personalities, and behavior patterns. A few children will be readily identifiable because of their exceptional abilities, or because of physical limitations in sight, hearing or other areas, and differences in emotional and psychological make-up. Program administrators must decide how they can meet the needs of exceptional and/or handicapped children without short-changing the rest of the children in the group.

Because the severity of learning difficulties is not always recognized, any handicapped child should be evaluated by the director of special education to determine the child's best placement. The director of special education should be able to identify new and interesting programs for handicapped children and local resources to implement them. Special programs can provide opportunities for these students to experience success and expose them to special activities and/or equipment.

The needs of exceptional children can very often be met in the regular classroom, provided the number of exceptional children in a single classroom is limited. An exceptional child can usually profit from kindergarten programs without requiring an excessive amount of teacher time or detracting from others in the group. Also, the presence of an exceptional child offers certain rewards and stimulation for other children, developing the sensitivity to individual differences that is an important outcome of anyone's education.

Additional information and assistance with children that have special education needs can be obtained through the Division of Special Education Services, State Department of Education (Salem, 378-4776).

3. ASSESS THE NEED FOR CLASSROOM SPACE AND FACILITIES AND LOCATE THE APPROPRIATE RESOURCES.

Minimum standards: Because kindergartens are included as part of the regular elementary school program, the minimum standards for elementary and secondary schools will apply to kindergarten facilities.

Classroom: A normally bright, sunny classroom with at least nine hundred square feet of space for each 24 children meets the minimum standards. The shape of the room is not important, provided that a large unobstructed space is available. Teachers should be able to survey the entire room at once, a consideration affecting the use of room dividers.

Facilities: Running water, sinks and drinking fountains should be part of every classroom. Easily supervised toilet facilities should be located very near the classroom.

Playground: The playground area should provide at least 75 square feet of space for each child. Although playground space may be shared with other primary grades, kindergarten children should have access to the area by themselves for part of the day. Playground fences may be required because of nearby traffic hazards.

Transportation: Kindergarten children may be transported on public school buses, with reimbursement based on approved cost of transportation. Districts may also

00008

arrange for parents to transport kindergarten children to and from school as part of the district's basic transportation plan and claim reimbursement. Lloyd Thomas, Director of Management Information Services at the State Department of Education, may be contacted for further details (Salem, 378-3611).

4. DEVELOP A BUDGET FOR SUBMISSION TO THE VOTERS.

Costs for establishing and maintaining a kindergarten vary so much that it is difficult to generalize about actual figures. Cost estimates should include such items as: capital outlay, transportation, salaries, fixed costs, instructional materials, and the program's share of basic costs.

Salaries for teachers and support staff are the biggest item in kindergarten budgets that have been submitted by local districts. The cost of support personnel such as a district nurse, a specialist in extreme learning problems, a speech clinician, social workers and guidance specialists will add to basic program costs. This support staff is, however, of great value to a kindergarten program.

During the last three years, districts implementing kindergarten programs have estimated initial costs of setting up facilities at $1,700 to $2,000 per classroom. Per pupil costs have been estimated by districts for the spring of 1974, ranging from $350 to $600.

5. DEVELOP JOB DESCRIPTIONS AND EMPLOY A KINDERGARTEN STAFF.

The minimum standards for elementary education require one teacher for every 24 children in the primary grades. A kindergarten class with a certified teacher and an aide for every 20 children provides a better ratio for group activities. Larger and smaller groups may be organized for specific activities. Sometimes a teacher or support staff may wish to work with one or two children needing special assistance or training.

Teacher qualifications: Kindergarten teachers must hold a current valid elementary school certificate. A "teacher" is defined as any certified employe with direct responsibility for instruction who is paid from public funds (ORS 342.120). It is also advisable to seek teachers who have completed special training in early childhood education and development, meeting the preparation standards suggested by professional organizations. Many graduates of elementary education training in Oregon institutions are now qualified in early childhood education. Teachers should have experience in working with young children under supervision, either in preservice or in-service programs.

Kindergarten teachers should demonstrate a thorough knowledge of the growth and development of young children and the application of educational practices and theories for children under six years old. Teachers with personal qualities of empathy, warmth and emotional maturity will contribute to the success of the programs.

Teacher aides: Teacher aides may also be employed in kindergarten classrooms. A "teacher aide" is defined as a noncertified employe whose assignment is limited to assisting a certified teacher.

6. PLAN AN INSTRUCTIONAL PROGRAM FOR THE KINDERGARTEN.

House Bill 2031 specifies that kindergartens are considered half-day programs for the purpose of basic school support reimbursement. A half day is defined as 2½ to 3 hours per day (ORS 339.410).

Records and reports: Records are valuable and necessary. The kindergarten staff should work together to determine the form and type of records that will be most useful to their specific program. Daily records, including detailed accounts of an individual child's activities, can be very valuable if taken over a period of time or at specified intervals throughout the year.

Special consideration must be given to the type of records used in reporting to parents. These records should reflect the philosophy of the district towards kindergarten programs and provide information on the child's development that will assist parents and teachers in working together. Written records, as well as conference procedures, are invaluable in reporting to parents about kindergarten programs.

Assessment: Two types of assessment should be considered as part of the kindergarten program: (1) assessment of the individual characteristics of each child; and (2) assessment of each child's learning environment, including such factors as the people, space, materials, equipment and time which will provide the best possible learning experiences for an individual child. Assessment of each child is the classroom teacher's primary responsibility, with assistance from counselors, nurses, speech clinicians, psychologists or other members of the support staff.

Assessment should take place early in the kindergarten year and at regular intervals throughout the year for two reasons: (1) individual program design; and (2) for making general curriculum decisions about the content, scope and sequence of experiences, as well as tempo or pacing in the classroom. Early assessment provides for prompt referral of children with special problems, talents or gifts to professional services within the school and elsewhere in the community.

Diagnosis and prescription: Assessment of individual characteristics and the optimum learning environment for each child will aid in the diagnosis of the strengths and limitations of each learner. This analysis of each child's learning potential leads to the development of a prescriptive learning program, designed specifically for the individual child.

Planning curriculum through assessment, diagnosis and prescription will result in optimum learning opportunities for each child. Specific suggestions for kindergarten curriculum in the major subject areas are contained in the second half of this report.

Planning steps: Suggested steps for developing a curriculum program for kindergarten includes: (1) establishing program goals and priorities; (2) developing instructional guidelines; (3) involving primary teachers from kindergarten, first and second grade levels in the selection of activities and materials; (4) incorporating curriculum plans with a diagnostic-prescriptive analysis of the individual prospective students; and (5) providing for articulation

00009

between kindergarten and the primary grades. Articulation should be carefully planned to provide a continuum of growth throughout the early childhood education years.

7. PLAN STAFF IN-SERVICE FOR KINDERGARTEN TEACHERS AND OTHER EMPLOYES AS NEEDED.

Teachers of kindergarten and the primary grades need opportunities to plan together to provide for a continuum of growth throughout the early childhood education years (kindergarten through the third grade). Teachers need to know, through first-hand experience, what is happening at each level of early childhood education. In-service programs for all early childhood education teachers will help the staff to respond to the different rates of development in each child and allow them to progress along a continuum that is unfettered by labels segregating kindergarten activities from the other level.

8. PURCHASE INSTRUCTIONAL MATERIALS AND EQUIPMENT WHEN AUTHORIZED BY THE BUDGET DIRECTOR.

Suggested equipment and materials: Keeping in mind the ways in which children learn, selection of materials and equipment should be made on the basis of some of the following considerations:

- Contribution to implementation of goals
- Ability to suggest construction projects and inspire creative expression
- Ability to arouse curiosity and interest
- Safety, stability, and freedom from sharp corners and splintering
- Provision for physical activity and manipulation
- Ability to suggest dramatic play and communication of ideas
- Suitability of materials and equipment for group and individual use.

The use of appropriate equipment and materials, when wisely chosen by teachers and administrators, can foster development in the important educational objectives of resourcefulness, creativity, responsibility, independence, and social and motor skills. A list of suggestions for basic kindergarten materials and equipment is available from Jean Spaulding, Primary Education Specialist for the State Department of Education (Salem; 378-3602).

9. PLAN A SPRING REGISTRATION PROCEDURE TO PROVIDE ORIENTATION FOR PROSPECTIVE STUDENTS AND THEIR PARENTS.

Plans for spring registration should include notification of parents, information and orientation for parents and children, schedules for registration and transportation, and provisions for a health check-up. Plans should also be made for registration of children who are eligible, but cannot preregister.

Enrollment: An enrollment record generally includes the child's full name; parents' names, addresses and phone numbers; and the family physician's name, address and phone number for notification in an emergency. Other information useful to the school such as the bus number may, of course, be added.

Immunization and health check-up: House Bill 2042 requires that children between 5 and 14 years of age be immunized for specified communicable diseases before they enroll in any public, private or parochial school. The State Health Division specifies the immunization required, and the law states that children who fail to comply will be excluded from the school. Exceptions are granted in the following cases: immunization may endanger the health of a child in certain cases; parents or guardians may certify that immunization is contrary to their religious beliefs; parents may sign an agreement to arrange privately for immunization within 30 days. The Oregon Division of Health Services for the School Age Child also recommends that a physical examination be obtained by every pupil prior to initial entrance into school. Information is available from the county health department.

Orientation program: The principal should support the teacher in developing an ongoing program that involves both the parents and children. Teachers may visit parents in the home or invite them to school during the week prior to the opening of kindergarten classes. Teachers can encourage parents to share information about their children's early life.

Clearly written records should be developed and available to the public that contain school policies towards entrance requirements and registration procedures, requirements for health records and birth certificates, special fees, transportation requirements, and school schedules. Also, groundwork should be laid towards building pertinent information in the child's confidential file.

10. PREPARE THE KINDERGARTEN FOR THE OPENING OF SCHOOL.

The final preparation steps include making necessary adjustments in classroom facilities, planning shortened school days and staggered enrollment during the first week of school, and developing an identification plan for children and their school buses.

11. MAKE PLANS TO PROVIDE ONGOING COMMUNICATION BETWEEN PARENTS AND TEACHERS ABOUT KINDERGARTEN CHILDREN.

Parents and teachers can share their knowledge of the child and his development through scheduled room meetings, parent visits to the classroom, individual parent conferences, and telephone conversations with parents who cannot come to school. Children can be encouraged to take materials home to share with their parents; newsletters to parents can also report on the school activities. Teachers can also establish a "parent center" in the classroom, where parents may find reading and resource materials on early childhood education, enjoy a cup of coffee and hold informal conversations with members of the school staff.

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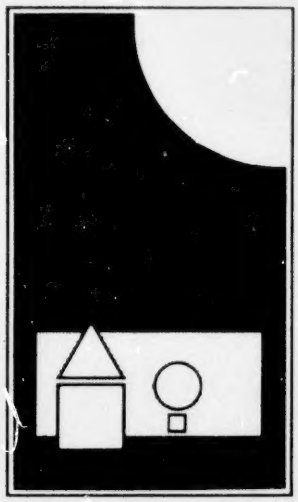
SECTION 2



Resources for Planning Kindergarten Curriculum

RESOURCES FOR PLANNING KINDERGARTEN CURRICULUM

1. GENERAL SUGGESTIONS FOR KINDERGARTEN PROGRAMS

Plans for curricular activities: Early childhood curriculum should include activities that are appropriate for young children and that will lay the foundation for later instruction. For example, general activities that will contribute to learning in science are: **observing** the characteristics of objects and living things in the environment; **classifying** and **categorizing** distinctive features of these observations; and **describing** the relationship between things that are observed. These activities begin to build the concepts needed by young children to understand scientific interpretations of their world.

Solving practical, everyday problems may help to develop basic concepts for later learning in all academic disciplines. If teachers are aware of the basic understandings that can be appropriately developed with young children, they will be in a better position to select and guide their activities.

Many different opportunities to interact with a rich and challenging environment will provide children with a stable orientation towards new learning experiences. Animals, plants, rocks and all such realia must be present in the programs and used effectively. Children need opportunities to interact with people, to take field trips that will broaden their experience, and to have visual media bring more of the world to them.

A curriculum designed to foster children's ability to think and conceptualize should be balanced in content. Activities in reading readiness or other basic skill areas should not be over-emphasized to the exclusion of root experiences that foster understanding of science, mathematics, music, language and the arts.

Goals for kindergarten programs: A major goal of kindergarten programs is to develop each child's individual potential within the framework of society. The kindergarten program should also promote readiness for more formal instruction, supplementing the home environment and assisting each child in making a gradual and enjoyable adjustment to school.

A good kindergarten program should help children to:

- Develop an interest in, and experience the joy of learning
- Establish satisfying relationships with children and adults
- Extend their understanding of social interaction
- Further their physical development
- Maintain and develop optimum mental health
- Know and enjoy their cultural heritage through literature, music, the performing and fine arts
- Grow in understanding of spatial and quantitative relationships
- Develop an understanding of the natural environment
- Develop a capacity for aesthetic expression.

2. LANGUAGE ARTS

A kindergarten teacher must be responsible for helping children achieve proficiency in using the language; listening, speaking, writing, and reading readiness should be developed at each child's own level. A language arts program must also be purposeful and relevant to learning.

Rich and varied intake experiences will provide greater satisfaction for the child in his outgo experiences. Intake experiences in kindergarten are comprised of activities such as scientific demonstrations, trips, pictures and books. All kinds of intake experience may be useful in some way. Outgo experiences allow children to communicate their impressions of the world through play and other activities. Outgo experiences embrace all forms of communication, both verbal (language) and nonverbal (painting, sculpture, music, dance).

The kindergarten teacher constantly strives to guide children so that they have opportunities to:

- Acquire ideas, knowledge and opinions to communicate
- Present ideas in a sequential manner
- Extend their command of words and understanding of related concepts, allowing them to communicate their thoughts satisfactorily
- Improve and extend their use of language, emphasizing patterns that are grammatically correct
- Clarify their thoughts through oral expression, speaking in a pleasant voice with sufficient volume to reach others
- Enunciate distinctly and pronounce words accurately
- Acquire a feeling of security in sharing experiences with others in the group
- Listen attentively and follow directions
- Appreciate the significance of both spoken and written words.

3. READING READINESS

Maturity and reading: While the kindergarten teacher cannot be expected to endow children with increased mental capacity, the teacher can and does help them to use the intellectual capacity they do possess in advantageous ways. The teacher can provide opportunities to: reason, solve problems, make decisions, follow directions in sequence, and concentrate on one activity for increasing lengths of time. Children need to do all of these things in order to successfully pursue the first-grade reading skills.

Experiential background and reading: The richness of children's experiential background, providing them with information and concepts, is closely related to their ability to think. Many studies show a favorable relationship between background experience and reading ability. The kindergarten contributes most generously to experiential growth through activities such as nature excursions to see birds, squirrels, trees, ice, frost, dew, spider webs, ant hills, etc.; industrial excursions to visit a creamery, a bakery, a fire station, a railroad yard, etc.; experiences with raw materials such as making jelly, butter, gingerbread, etc.; construction activities such as building a village with

00012

houses, stores, churches, schools, or making a park with trees, flowers, a lake, boats, a zoo, etc.

Emotional and social maturity and reading: Numerous studies have revealed a high relationship between reading success and emotional maturity. What happens in the kindergarten that promotes emotional and social growth? The teacher is alert to the symptoms of timidity, aggression, fears, and the need for success and approval. Each child needs help to develop in terms of his or her own needs. In group work, the children learn that their own interests are best fulfilled through cooperative effort towards common goals and the sharing of interests and ideas. These emotional and social experiences provide substantial help when the child undertakes the formal reading process.

Language development and reading: Research clearly indicates that the ability to listen to a story and supply a reasonable ending is one of the best predictors of success in reading. Plentiful evidence shows that development in the other language arts is closely tied to reading development. Consequently, activities that promote vocabulary enrichment, correct English usage, fluent speaking, and good listening in kindergarten will contribute to reading development. The kindergarten teacher can do many things to encourage language development, including: providing a friendly, rich, and interesting environment that encourages children to talk; giving them firsthand experiences to talk about; inviting them to relate personal experiences, retell stories, and make up their own stories and poems. In doing all these things, the teacher helps each child develop the language facility needed for successful learning in reading.*

Informal contacts with reading: The teacher can plan to emphasize written language by: (1) placing memorandums on the chalkboard or writing orders for school snacks, names of committees and their members, simple rules, and simple directions for some activity like making applesauce (pare, wash, cook, sweeten); and (2) placing surprise sentences on the bulletin board each morning, such as "Susan will bring her pet rabbit tomorrow." Let the children try to guess what the surprise is, then read it to them.

The teacher can call attention to printed material on walks or excursions—the names on packages in store windows; signs on store buildings; names of streets; names on trucks, street cars and buses; danger signs; and so on. The teacher should frequently let children see their own words flow into printed symbols as she writes them on chalkboard or tagboard. Every opportunity should be used to write as the children watch; write notices, plans, suggestions, and directions which they have composed. While the children should not be required to read the words, phrases, or sentences, they will have the valuable experience of seeing meanings which grow out of their own experiences.

Reading skills and attitudes for development in kindergarten: An outline of some of the reading skills developed in kindergarten is included for those teachers who want to provide a reading readiness program.

Getting ideas from pictures

- Telling about a picture
  - Increasing language facility
  - Recognizing objects and actions
  - Making interpretations beyond what is seen
- Arranging pictures
  - Creating awareness of sequence in action and time
  - Developing left-to-right mechanics of reading
  - Telling stories from picture sequences.

Getting ideas from stories

- Developing awareness of characters, simple plot, and setting
- Differentiating between what is real and what is imaginary
- Retelling stories with sequence and detail
- Enjoying both prose and rhyme
- Observing that pictures relate to story content.

Handling books

- Learning how to hold a book and turn the pages
- Developing awareness of left-to-right sequence and top-to-bottom page procedures
- Relating pictures to what is known about the story
- Respecting books and appreciating their beauty and diversity.

Auditory and visual perception

- Listening for and identifying common sounds heard in the environment (birds, motors, etc.)
- Perceiving and locating sounds in written language
- Listening for likenesses and differences in sound at the beginning or end of a word (cat–can, cat–bat, etc.)
- Singing many meaningful songs
- Noting likenesses and differences in children's names
- Seeing and feeling likenesses and differences in forms.

Developing good speech

- Retelling stories with good expression
- Reciting rhymes with good expression and proper pacing
- Recognizing the importance of appropriate volume, pleasant tone, and choice of words in communicating with a group.

Developing a wholesome attitude towards reading

- Anticipating learning to read because reading has been observed as a rewarding and pleasurable experience

*CHILD, Available at $4 per copy from Copy Print Centers, 1206 SW Jefferson, Portland, Oregon 97201 and Northwest Regional Lab, 710 SW 2nd Avenue, Portland, Oregon 97204, is a rich resource of language activities.

00013

- Taking advantage of the "listening posts" and other opportunities to hear stories and poems read
- Experiencing dramatic play as a natural way of using language, enacting stories, and taking the role of someone else (as often occurs in reading stories).

4. WRITING READINESS

Kindergarten children can be given many opportunities to experiment with and pursue their awakening interest in writing. Foundation experiences for writing are provided by many large muscle activities—climbing, balancing, building with large blocks, and rhythm activities. These experiences promote gains in the large muscle coordination involved in writing. While all children should be exposed to the writing readiness program, some children will actually pursue writing activities. Beginning writing must be supervised to avoid establishing incorrect habits.

Experiences that provide opportunities for the development of dexterity and coordination are listed below:

- finger painting, brush painting
- drawing on paper and chalkboard
- operating the clips and implements that hold paper on the easel
- washing paintbrushes and other equipment
- pasting, cutting, and tearing paper
- modeling with clay and other media
- using hammer and nails and other woodwork tools
- using a paper punch
- lacing shoes, tying knots and bows on shoes and work aprons
- buttoning and unbottoning, zipping and unzipping, snapping and unsnapping, hooking and unhooking fastenings on their own clothes, doll clothes or costume clothes
- picking up and sorting out such things as seeds, spilled pins, thumbtacks or other small items
- picking out tunes on the piano
- operating the record player
- handling science equipment and pets
- manipulating pegs, form boards, puzzles and beads
- manipulating such play materials as small interlocking and snap blocks
- turning the pages of a book
- handing out cards for matching games
- posting pictures with thumbtacks or pins
- arranging figures on felt or magnetic boards
- handling, manipulating and even spelling out words with molded form letters
- constructing with unit and hollow blocks.

Some experiences that will help children realize that writing is a means of identification are:

- putting signs on construction projects
- recognizing labels on equipment
- having names on work
- seeing captions on bulletin boards.

The following experiences will help children with the techniques of manuscript writing:

- learning left-to-right
  - observing the teacher demonstrate left-to-right movement in using books and charts
  - viewing a sequence of pictures from left-to-right
- observing teacher write correctly
  - using capitals and small letters properly
  - demonstrating good letter formation
  - placing letters on a horizontal line
- drawing readiness figures
- learning to make circles
- learning to make straight lines from top to bottom and from left-to-right
- learning to write own name on the chalkboard and on paper (if ready)
- learning to write the manuscript letters correctly (if ready).

The following techniques apply to writing activities for right- and left-handed children.

- **Right-handed child**: The right-handed child should have the paper parallel to the edge of the desk and slightly to the right of the body. The child should sit well back in the desk with elbows just off the edge. The crayon or pencil should be held about an inch from the writing point between the thumb and second finger, with the index finger resting lightly on top. The child should be taught to hold the crayon or pencil lightly between the thumb and second finger first, and then to drop the first finger on top of the crayon.

- **Left-handed child**: The left-handed child should place the paper parallel to the edge of the desk, holding the pencil in the left hand and following the same procedure as the right-handed child.

5. SOCIAL STUDIES

The growth of social concepts in the young child begins with self-understanding as an individual. The young child's concept of membership in the large society is gradually developed by experiences that create familiarity with the neighborhood and adult roles in the community. The rudiments of history, geography, economics, and the other social sciences are also rooted in these experiences.

Objectives to consider in the selection of social studies activities include:

- Helping the child relate school experiences to home and community situations
- Developing understanding of the importance of school in the child's life
- Increasing the child's awareness of the need to follow rules and regulations developed for the benefit of a group
- Developing the child's self-respect and an understanding of roles of the individual in a group
- Involving children as eager participants in school

00014

PRE-WRITING SKILLS CHECK SHEET I

A. Outline: trace a simple picture or an object with pencil or crayon staying on the line approximately 3/4 of the way.

B. Color simple picture of an object with 1 or 2 large spaces:

1. Color, moving crayon in one direction _____
2. Color just to the line and not over it.

C. Cut a simple object out on the line, precisely:

1.

D. Paste a simple object on another sheet of paper using:

1. Pasting skills _____
2. Even square or some type of planned spacing.

E. Write NAME (first):

1. Trace first name from model _____
2. Copy first name from model directly below it on blackboard _____
3. Write name without copy on blackboard _____
4. Trace name on unlined paper _____
5. Copy name from model directly below on unlined paper _____
6. Write name without copy on unlined paper.

F. Write NAME (last):

1. Trace last name from model _____
2. Copy last name from model directly below it on blackboard _____
3. Write name on blackboard without copy _____
4. Copy name from model directly below on unlined paper _____
5. Write name without copy on unlined paper

G. WRITE first and last name sequentially:

1. Correct form _____
2. Correct size of letters _____
3. Correct spacing between letters and words.

Instructional Note: Not every child will need all these steps, but each child should be tested on each skill using the steps deemed necessary.

Key: I=Introduced M=Mastered Number Code Date

00015

activities and helping them to appreciate the roles of school personnel

- Helping the child recognize the value of our resources and our responsibilities to conserve them
- Arousing the child's curiosity about people, places, and things both near and far away
- Building an appreciation of the compatability of cultural differences
- Inspiring in children a love of country and pride in being an American
- Learning about social organization and developing a sense of participation and responsibility
- Helping the child realize the interdependence of family members, economically and socially
- Sharpening the child's observation of changes in seasons, families, schools and communities
- Helping the child develop functional skills related to gathering and using information in the social sciences; e.g., listening intently and observing accurately, developing simple map and globe skills, classifying, drawing inferences and making simple generalizations.

6. ENVIRONMENTAL EDUCATION

> ...."for the parent (or teacher) seeking to guide him, it is not half so important to know as it is to feel. If facts are the seeds that later produce knowledge and wisdom, then the emotions and the impressions of the senses are the fertile soil in which the seeds must grow. The years of early childhood are the time to prepare the soil. Once the emotions have been aroused—a sense of the beautiful, the excitement of the new and the unknown, a feeling of sympathy, pity, admiration, or love—then we wish for knowledge about the object of our emotional response. Once found, it has lasting meaning. It is more important to pave the way for the child to want to know than to put him on a diet of facts he is not ready to assimilate."
>
> —Rachel Carson in *Silent Spring*.

For the kindergarten teacher and her pupils, environmental education takes place wherever they find themselves—in the classroom, playground and cafetorium; on the way to and from school; on walking trips, field trips and on the bus. Environmental education is not a distinct and separate discipline or study area. It permeates the entire school day and all of life.

Five-year-olds have senses and feelings that are clear, fresh, and full of wonder. The teacher can build on such beautiful attributes by providing learning activities that emphasize the relationships between people and their many environments, the power of society to control environment, and the responsibility of preserving and protecting it.

The many activities provided five-year-olds at school—communication skill development, art, music, physical education, use of the senses and number relationships—can easily incorporate the environment as a vehicle for simultaneously learning basic skills and about the environment.

A broad program goal for environmental education is to develop students who will recognize problems which affect the interdependent life systems in the environment. Some specific competencies for kindergarten pupils to develop are the ability to:

- Use their five senses in developing an awareness of their environment
- Discuss what they see, feel, hear, smell, and taste in the world around them
- Draw pictures of things they observe
- Tell about how things in the environment affect their feelings
- Learn songs about their natural and man-made world
- Note seasonal changes in nature and how they affect living things
- Observe polluted, blighted and unsightly areas and discuss possible actions for prevention and correction
- Assist in maintaining a good environment in their classroom, school and playground.

An outline of suggested learning activities that relate to the environment appears below:

Exploring

- What can be seen out the window? Are they big, small? What colors can you see? Name things that can be seen and explain how they are alike and different.
- Tour the schoolgrounds and look for specific things grass growing in sidewalk cracks, insects, birds, flowers.
- Touch and describe objects—tree bark, stones, glass, cloth, seeds, etc. Put objects in a sack, feel them without looking, and try to identify them.
- Listen for one minute and describe what you heard. Were sounds man-made or made by nature? Were some more pleasant than others?
- Look for signs of wear or erosion around the school. Discuss how long it took for these changes to occur.
- Notice seasonal changes in plants and trees near the school.
- Identify birds near the school in spring and winter. What happens to some in the winter?
- Take walking trips in different parts of the community. Are some areas more attractive, noisier, or more crowded? Why?
- Observe trees and look for mistletoe and puffball. Look for insect and bird life in trees. Is there a relationship between them?
- Look for traces of life around the school or on a walking trip. What organism left the trace?

Experimenting

- Plant and grow plants. What happens to them over a period of time (life cycle)? Do other living things have life cycles? Do non-living things go through

00016

cycles (water, styles)?
- Make a musical instrument out of something discarded or found in nature.
- Make up dances to express how you feel about things in nature (the wind, a flower, a bird, a stream).
- Care for animals at school (observe all safety and health requirements). What must you provide them?

Visiting

- The local water system
- The parks
- Waste disposal facilities
- Transportation systems
- Major industries
- Weather station
- Newspaper, radio and TV stations
- Electrical plants or substations
- Nearby rivers, lakes, forests, desert areas and the seashore
- Blighted urban areas
- Eroded areas
- Farms
- Nurseries and hatcheries.

Making things

- Scrapbooks
- Posters
- Puppets
- Paper aprons, placemats and tablecloths from material that would have been thrown away.

7. HEALTH EDUCATION

Health education is an integral part of the kindergarten program. Through health education, children have an opportunity to acquire information, skills and attitudes that will help them lead a meaningful life. Health services should be supplied in accordance with children's needs. Some needs are determined by the child's stage of growth; others are related to factors such as illness, accidents or organic disorders. The physical growth of five-year-olds demands activity and exercise, which, in turn, creates a demand for rest. Consequently, kindergarten programs should be planned with alternating periods of vigorous and quiet activity. The main objectives of a kindergarten health program should be to: (1) help maintain or improve the health of each child; and (2) help all children establish good health attitudes and habits.

Safety: Teachers should watch for and eliminate potential safety hazards, arranging classroom equipment with safety in mind. Because fatigue and over-excitement can often cause carelessness, well-balanced programs of quiet and vigorous activities should be planned. Children should learn how to use apparatus, equipment and materials properly.

Cleanliness: Not all children come to school with the same standards for cleanliness. In extreme cases of negligence, teachers should attempt to find out the reasons in the child's home life for poor personal hygiene. Their findings may indicate ways in which assistance may be given. When children are dressed in washable clothing, teachers need not worry excessively about cleanliness; a recommendation to dress children in washable clothes may be made to parents during orientation. Children are free to work and play creatively when they know it is all right to get dirty. The important habits of washing before contacting food, after handling animals, and after toileting are not easily acquired; they should be encouraged in the classroom by teachers.

Frequently, it would be simpler for teachers to clean up after the children than to have them do their own cleaning. The promotion of efficient work habits, however, requires that children be taught to clean up after themselves before they begin new activities. Teachers should not expect perfection, but keep realistic goals in mind.

Posture: Girls and boys develop muscles which promote good posture as they climb on playground apparatus, relax, sit comfortably for short periods of time, express ideas and emotions through rhythms, wear well-fitted clothing, and feel successful and socially accepted. Proper nutrition, exercise and rest contribute to children's feelings of well-being. Teachers should recognize that the normal stance of young children differs from adults and encourage individuals to sit in chairs suited to their size.

Nutrition: Much education concerning nutrition is centered around the few minutes designated as "snack" time. Consequently, only good nutritional foods and beverages should be served. Celery strips, carrot strips, whole wheat crackers, cheese, apples, tomatoes and oranges are better than cookies or crackers. Fruit or vegetable juice is sometimes a welcome change from milk. "Snack" time can also be used to develop good manners, social relationships and personal hygiene habits.

Mental health: The kindergarten year is crucial for development of children's self-concept and their ability to relate well to other people. The following activities will promote sound mental health among kindergarten children:

- Learn some ways of meeting psychological needs
- Help others and receive help
- Learn to show appreciation
- Learn how to release emotional tensions
- Play alone and with various numbers of children
- Enjoy funny situations
- Dramatize home experiences
- Return borrowed articles
- Make decisions commensurate with their level of development.

Rest: Children can learn to relax and rest informally for short periods of time; however, the scheduling of formal rest periods must be determined by the local situation. In some instances, a period of calm activity provides sufficient rest. Some children may need a nap while others play or work quietly. Decisions are made according to such factors as the length of the school day, the distance the children travel to and from school, and the quality of their outdoor activity.

00017

8. PHYSICAL EDUCATION

Young children like to play. Play, after all, is the way of work for young children. Lifting large blocks onto a high platform to make a bus is hard work, but it is also play.

The five-year-old grows in physical ability through play. Young bodies are constantly active because muscles and coordination are developing. Climbing, reaching and grasping as children use playground equipment or apparatus helps them gain physical strength and muscular control. The child pulls himself up to the bar with a firm grip of both hands and, by observation, soon learns how to move across the bar. Play on the apparatus is often a series of experiments, observations and imitations.

Playground safety: When equipment or apparatus of any kind is used, the teacher must be able to recognize safe play procedures. Since the young child is not conscious of physical safety, the teacher's responsibility is great. Encouraging good coordination in pulling, lifting, pushing, hanging, dropping and stooping will help to minimize injuries.

Instruction in safe and correct use of playground equipment will develop good habits at the outset, rather than require children to change bad habits later. The teacher can watch children as they play and show them the correct handgrip on the horizontal bar, how to sit in the swing or rocker-ride, and encourage them to take turns. It is important to give kindergarten children basic understanding of the reasons for waiting turns and using apparatus correctly; good play habits will be valuable at a time when other pressures may crowd out learnings which are not yet habits.

Play supervision: Guided play is the young child's physical education. Each kindergarten child should be observed and guided when playing alone or with small groups in various activities. Teachers and aides can help individuals with fundamental skills when they need it and are ready; discourage participation in unsafe activities; and redirect play activities if a child becomes over-stimulated. Teachers should allow as much freedom and free play as possible without children hurting each other or engaging in other unsafe practices. Imitative play and rhythmic expression also play important roles in play activities and physical development.

Organized games: There is a lack of agreement on the place of organized games in the kindergarten program. Some kindergartens almost rule out organized games while others have a daily game period. Since there is not adequate research to support either procedure, perhaps kindergarten teachers should run a middle course by having some games without overemphasizing the game period. Since five-year-olds have little understanding of "your side," "my side," and competition, loosely organized games like the circle type seem best suited to them. As the group matures through the year (or if they are already more mature), additional more highly organized games may be introduced. More group games may be played in situations where playground space and equipment is limited than in programs that can provide ample space and equipment.

Motor skills

- Large muscle coordination
  - Exercises and games involving walking, jumping, running, skipping and climbing
- Sensory and motor coordination
  - Imaginative play on jungle gym, slides, trapeze bars, etc.
  - Bouncing, catching, throwing ball by himself or cooperatively
  - Easy relays
- Rhythmic activities
  - Singing games
  - Running, skipping, walking, sliding, hopping, etc., to music
  - Interpretative dancing (avoid "twist" and "go-go" by suggesting animal, tree, flower movements).

Safety at play

- Taking turns without pushing, etc.
- Using equipment properly.

Mental health

- Developing good sportsmanship and citizenship
- Following rules willingly
- Practicing both leadership and followership
- Demonstrating willingness to try new things
- Appreciating achievements of himself and others.

9. ART EDUCATION

Five-year-olds are explorers; the creative art experiences of kindergarten children should be exploratory in nature. The process is more important than the product at this age.

Five-year-olds have strong desires and real needs to satisfy their sensory urges. They need to be able to touch, feel, look, listen, stamp and jump, and to whisper and shout. All of these actions are attempts to become a part of the environment. Because kindergarten children have insatiable curiosity, teachers must provide unlimited opportunities for exploration and examination of different material without overemphasizing the finished product or asking "what is it?"

Teaching strategies: The teacher will recognize the sequence of growth in art expression while working with children. Manipulation gives way to basic symbols; later these symbols become more highly differentiated and increasingly comprehensible to the viewer. At no time in kindergarten, however, does the child's work normally resemble that of an adult. Because development cannot be successfully hurried, an adult should not substitute other forms or symbols for those created by the children. Children at this age don't really want help; they want the privilege of exploring with materials and seeing what the material will do.

A teacher must understand the stages of development in art expression. She must be able to interpret with considerable sensitivity and insight the various forms of

00018

expression that children adopt, and should be able to appreciate the aesthetic qualities that appear in all children's work. The physical setting and choice of materials for art activities should be carefully planned. The teacher's challenge is to find the necessary delicate balance between assuming leadership and allowing the children to: develop their own abilities; express their own ideas in their own ways; and choose their own media.

The art center: Children need to know how to use a new tool—how to hold a paint brush or scissors. With this knowledge and a little practice, children can then select project materials from the art center. The art center should be changed as frequently as the children's interests change—but not so rapidly that they feel hurried in the use of materials. Convenient work areas and readily accessible tools and materials are as important in the art center as in other work centers of the kindergarten.

Subject matter: Children select subjects to paint and choose materials that interest them and are in their experience. Some children are motivated by a good story or poem effectively read by the teacher. Dictatorial methods of motivation, restricting children's thinking and the art forms they may use, retard their normal development. The teacher should always remember that dominating children's ideas, working habits or designs will destroy the educational values inherent in the art education program.

Work areas: Work areas with adequate tables, easels, and clean-up facilities are essential for creative art experiences. The tables should have smooth washable tops and be of a comfortable work height. The easels can be permanently installed or movable. They should be a convenient height and have a washable finish. A suitable floor covering under the easels and a classroom sink can make clean-up much easier. Sponges may be cut to fit five-year-old hands encouraging them to be independent in cleaning up. Either plastic aprons or work aprons of some other material help keep the children's clothes clean and make for freer use of creative art materials.

The learning activities that will provide for the attainment of the following art education objectives require exploration, manipulation and some freedom:

- Increase children's awareness of their world
- Prime the child's potential creativity and curiosity
- Increase visual awareness through use of the senses—feeling, touching, looking, etc.
- Encourage self-expression of feelings and ideas in visual language
- Acquaint the child with various materials
- Develop independence and different ways of working with materials
- Encourage the expression aesthetic feelings about experience
- Teach habits of neatness and good housekeeping
- Develop the ability to listen to and follow directions
- Develop the skills needed in art work.

Art skills

- Differentiate between colors
- Properly hold and use scissors, paint brush, crayons, chalk, pencils, etc.
- Choose appropriate materials to meet various art situations
  - Clay and modeling compounds
  - Paper
  - Paints—tempera, watercolor and finger paints
  - Wood and tools
  - Cloth
  - String and yarn
  - Paste—one finger activity
  - Glue—just enough
- Develop independence in finding and using unusual art media
  - Bottles
  - Paper bags
  - Newspapers
  - Sticks
  - Aluminum foil
  - Paper towel rolls
- Learn to respect the rights of others and their work
- Appreciate the process as well as the finished product.

10. MUSIC EDUCATION

The kindergarten child should experience singing, listening and moving to music every day. Children will learn concepts of rhythm and melody best through activities that involve bodily movement such as clapping, using rhythm instruments, and experimenting with sounds and singing. Major goals of kindergarten music programs are to provide children with: (1) freedom to enjoy and experience music; and (2) repeated exposure to a variety of music media.

Singing: In kindergarten, singing should be spontaneous and free and will ideally go with children as they leave the classroom. The teacher who is enthusiastic, enjoys singing, knows the songs well, and who uses appealing, worthwhile and appropriate materials will achieve good results with children. Five-year-old children can learn a wide variety of songs, including folk songs, action songs, nursery rhymes, child-composed songs, nonsense songs, seasonal music, work songs, lullabies and patriotic songs. In order to insure growth, a planned and balanced singing program should occur daily with a variety of song material, creative rhythmic experience, appreciation and participation in song games and dances.

Children learn to sing by singing. Kindergarten teachers have found the following steps effective in teaching a song:

- Singing the song as a whole
- Inviting children to join in the song as soon as possible
- Encouraging children to sing easy or repeated phrases
- Devoting several days to learning a song.

The teacher can introduce a number of songs concurrently. The interest of children in music is so great that they can become familiar with several new songs each week.

Few kindergarten children are self-conscious about their voices or are aware that they are not singing correctly.

00019

Consequently, pointing out a child whose singing is inaccurate may destroy his or her progress and self-confidence. Many children have not yet learned to sing accurately; this does not indicate that they are unmusical, however, only inexperienced or insecure. The best possible activity to help improve singing is actually singing freely and joyously.

A variety of accompaniment is desirable. The teacher may use autoharps for folk songs; wood blocks and tone blocks for clock songs; and black keys at the piano for oriental songs. Many songs will be sung without accompaniment. An overuse of piano accompaniment will discourage independent singing. Occasionally, recordings or an accompanist may be used in teaching songs.

Movement: Along with other forms of expression in language and art, rhythmic movement or dance gives great joy. It begins whenever movement takes place—walking, skipping, galloping, bouncing on a board, singing a jingly tune, or tapping and whirling for fun. Rhythm is so natural to children that sharing the fun of movement is satisfying to them. If a tune is hummed, a song sung, or a simple instrument played, the rhythm experience is enriched. Rhythm does not necessarily have to be accompanied by music, however.

Rhythm activities begin with an individual and may involve a small group and, finally, a large group after many informal experiences have been enjoyed. Exploration and experimentation afford intellectual and creative development as well as emotional release.

Experimenting with sounds: The life of a kindergarten child is full of sounds—from the roar of a jet to the chirp of a cricket. Sounds capture children's interest and stimulate their imagination, especially when listening to music at home and at school. Kindergarten programs should provide music of varied styles, periods and composers—enriching musical background and encouraging familiarity with a variety of music.

Listening: Quiet listening is a favorite musical activity in the kindergarten and can be planned many times during the day, acquainting children with some of the world's most beautiful music. Piano music can be satisfying for quiet listening. Phonograph records provide resources for broad, rich and varied listening experiences.

Children enjoy concerts heard in the classroom, school auditorium, concert hall, and on radio and television. Performances by other children are of particular interest. Any planned concert for children should consider their interests in the choice of music, the length of the composition and the length of the entire program.

Creating: A child makes noises with hands, tongue and feet. Using all kinds of sound-makers increases children's ability to recognize variations in tone quality, pitch, duration and rhythm patterns. As children discover that music tones can be produced in many ways, creative expression and interest in playing instruments may be encouraged.

Instruments are closely allied to the natural rhythms of children and encourage creative expression. Consequently, teachers should guide children to express their feelings and ideas with instruments rather than beat out preconceived rhythmic patterns. Children especially enjoy experimenting with rhythm instruments. In selecting instruments, major consideration should be given to quality, tone and durability of materials. Instruments should be purchased individually rather than as a set.

As children experiment with instruments, they may begin to combine a few of them in simple, original arrangements accompanied by the teacher at the piano. Present trends are decidedly away from the formal rhythm band with its rigid patterns, costumes and child director (delighting in the opportunity to show off for admiring adults). This staging and rigidity does not encourage musical development. The kindergarten teacher should work with children's natural interest and help develop a growing, continuing interest in the various aspects of music education.

The kindergarten music program affords the child opportunities to attain the following objectives:

- Listen to and enjoy good music
- Experience the pleasure of group singing
- Enjoy and learn how to control one's own singing voice
- Build up a repertoire of songs
- Develop a feeling for and a sense of rhythm
- Develop motor coordination and grace
- Cultivate the ability to pay careful attention
- Express creative ideas and moods through bodily movements
- Develop social habits and cooperation necessary for group appreciation of music
- Develop ease in performing before a group.

Music skills

- Control and use of singing voice
- Ability to follow short melody accurately
- Recognition of like, different and similar phrases
- Ability to show, with the hand or body, up or down direction of melody
- Recognition of the mood of a song
- Appropriate rhythmic responses to music; i.e., hopping, skipping, marching, running, walking, galloping, gliding, sliding
- Ability to imitate rhythmic patterns by clapping and by using rhythm instruments
- Ability to interpret music creatively in dance, painting, etc.
- Ability to recognize the rhythm instruments used in kindergarten
- Good listening habits.

11. SCIENCE EDUCATION

Preschool science: The preschool child engages in problem solving activities quite naturally while trying to understand the "how" and "what" of the environment. Each kindergarten child has already developed a great number of science-related concepts representing diverse experiences in observation, interpretation, organization, evaluation, experimentation, analysis, and in making hypotheses, generalizations and comparisons about phenomena in his environment. All children have common understandings of day and night, growth, hot and cold, energy,

00020

heat, friction, inertia, plants and animals, weather, sound, electricity, and man's accomplishments in space; these concepts form a foundation for extending science knowledge in the classroom.

The teacher does not know, however, what specific ideas the individual child has gained from these experiences or how much awareness has been developed of the cause and effect relationships operating in the environment. The teacher can be sure that some of the concepts the child brings to kindergarten are vague, incomplete and, in some instances, erroneous.

Kindergarten science programs: The kindergarten teacher should help the children extend, refine, and add to the concepts they possess when they enter kindergarten. Science activities should be planned that enable children to relate present to past learning experiences, broadening their frame of reference and science vocabulary. Unless class learning is clearly connected to what the child already knows, the continuity of learning will not be recognized.

Teaching strategy: In planning science experiences for kindergarten children, the teacher should use techniques that: (1) capitalize on teachable moments; (2) use community resources effectively; and (3) provide stimulating and appropriate activities with ample opportunity for children to question, explore, and experiment.

Questions posed by the child and those asked by the teacher are equally important. The child's questions reveal areas of interest, past experience, and concept development; they also provide the "teachable moments" for the teacher. The teacher's questions can direct the child's observations and, at the same time, develop greater perceptual awareness. Being told about science does little to increase perceptual awareness; the teacher's questions, however, can point out what to look for in particular situations, gradually showing the learner how to observe. For example: ask the child to tell what he knows about environmental change in the weather (night and day, the seasons), plants and animals, etc.); help to organize this information into a meaningful pattern, adding a dimension to the child's awareness of change. New discoveries may be that: (1) change is rhythmic and orderly; (2) change can be explained in terms of cause and effect relationships; and (3) change is a universal phenomenon.

Science curriculum: It is important to plan for two aspects in the science curriculum: (1) the aspect concerned with observation and the description ("what happens"); and (2) the aspect concerned with explanation and interpretation ("where does it happen"). Teachers are cautioned to remember not to move too soon from simple observations into explanations and interpretations.

The child should be involved in a science problem that he or she has identified and chosen as interesting. The teacher should help the child recognize the connection between past and present experiences and provide guidance in making generalizations that will add to concept development in the future.

Science objectives

- Acquaint the child with the world around him
- Help each child establish a personal relationship with this world.

12. MATHEMATIC

Kindergarten children should be provided with many experiences to strengthen and extend their understanding of mathematics and develop their ability to reason.

Mathematics programs in kindergarten should be planned to develop skills in sequence. An essential part of this program is, of course, the many number activities which naturally occur as young children participate in study activities, classroom routines and playtime games or rhythmic experiences. The introduction of various mathematical concepts through tactile experiences with many different concrete objects enhances the child's competence with numbers.

Another important phase of the math program is the guidance provided to large groups, small groups and individuals according to their needs, interests and abilities. The teacher should select and adapt math activities to meet the basic needs of each particular group and individual.

Incidental teaching: Numerous spontaneous opportunities arise each day to give kindergarten pupils number experiences; these incidents are necessary and recur throughout the grades, demanding ever growing insight. However, incidental experiences are not necessarily concrete and within the understanding of the child. Rhymes, games and counting activities are fun and help the learner become friendly with numbers. Many materials and activities used throughout the day lend themselves to numerical activities that are fun and educational for the child.

Planned teaching: Mathematics activities should give kindergarten children a variety of number experiences. The more ways that an idea is planned and experienced, the clearer it becomes. Teachers can build word meanings in number terms; use number situations from home and school activities; use play activities to teach numbers; and arrange opportunities to acquire number ideas by discovery. If number experiences are relevant to each child's readiness, greater independence and enjoyment in learning will be acquired.

Because mathematics involves a continual process of reasoning and discovery, increasing children's participation in activities that develop mathematical understanding is very basic to any mathematics program. Manipulation of concrete materials is a major consideration in this type of learning.

Mathematics educators generally agree that kindergarten programs should not require written work. Mathematical experiences, like any others, are most successful when they are interesting and motivational; allow for individual differences; and provide for the experience of success.

Mathematics competencies

- Count objects orally in a set of 10 or less
- Tell how many objects are in a set of 10 or less
- Recognize and name the number symbols 0-10
- Write the number of objects in a set of 10 or less
- Draw a picture or select objects that correspond to a given numeral of 10 or less
- Match, by numerical correspondence, separate sets of 10 or less objects

00021

- Tell which is greater, less, or the same when comparing object sets of 10 or less
- Supply the missing numeral in a sequence of 0-10
- Group shapes that are similar
- Tell home phone number and address
- Perform simple measurements (lengths in any convenient unit, and weights by balancing to determine heaviest, etc.).

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00022